

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

Conditional Major Draft Permit No. F-01-016

FIRESTONE BUILDING PRODUCTS COMPANY

COVINGTON, KY

JULY 24, 2001

JOHN LEWIS, REVIEWER

Plant I.D. # 21-117-00144

Application Log # 53282

SOURCE DESCRIPTION:

Firestone Building Products operates a rigid foam manufacturing facility in Covington. The manufactured foam is sold for building insulation. The current manufacturing process utilizes hydrochlorofluorocarbon 141b (HCFC 141b), Refrigerant Freon 22 (R-22), polymeric diphenylmethane diisocyanate (MDI), polyol, water, and other additives. Operations include unloading and storage of the chemical materials, material blending, panel production and cutting, and final product storage. The manufacturing process begins with the mixing of "B-side" materials (polyol, HCFC 141b, water, additives) and combining this mixture with the "A-side" MDI and R-22 at a laydown nozzle. This combination begins the reaction to create the foam which cures between paper and a backing. The foam is then set with heat while on a conveyor to the saw area. The continuous sheet of foam is cut into various panel lengths, trimmed on the sides, and perforated. Finally, the foam panels are stacked, wrapped, and stored until shipping.

Firestone is currently reformulating its manufacturing process in response to the requirements of Title VI of the Clean Air Act Amendments (CAAA) which requires the elimination of certain HCFC use beginning January 1, 2003. This permit authorizes construction which will modify the process to utilize pentane as a substitute for HCFC 141b and R-22.

COMMENTS:

Emission factors and their source:

01 Foam Laydown: Emission factors for HCFC 141b and R-22 are based on Firestone testing data. The emission factor for MDI was calculated using a formula from "MDI/Polymeric MDI Emissions Reporting Guidelines for the Polyurethane Industry", Society of Plastics Industry, Inc. 1996. This calculation incorporates evaporation rate, liquid vapor pressure, average molecular weight, temperature, air flow speed, and the area exposed. The emission factor for pentane is based on Firestone testing data from other locations that have shown the maximum VOC concentration in the process line air stream is 50 lb/hr. It is assumed that the process hoods will collect 80% of the VOC to be controlled in the regenerative thermal oxidizer (RTO) with a control efficiency of 95%. Emissions for the combustion of natural gas were calculated using emission factors from AP-42, Section 1.4.

02 Dust Collection: The emission factor for particulate matter is based on the actual particulate matter collected in 2000, the actual hours of operation, the production rate of rigid foam insulation, and an assumption that 99% of particulate is controlled by the filter system.

Applicable regulations:

401 KAR 59:010, *New process operations*, applies to the particulate matter emissions from units constructed on or after July 2, 1975, which are not subject to another emissions standard with respect to particulates in 401 KAR Chapter 59. This includes the following emissions points:

02 Dust Collection: Emissions of particulate shall not exceed 11.32 lb/hr and the opacity shall not equal or exceed 20 percent.

401 KAR 59:015, *New indirect heat exchangers*, applies to the particulate emissions and sulfur dioxide emissions of indirect heat exchangers with a capacity of greater than one million BTU per hour that were commenced on or after April 9, 1972 (for indirect heat exchangers with a capacity of 250 million BTU per hour heat input or less). This regulation is applicable to a boiler which is an insignificant activity.

401 KAR 50:012, *General application*, Section 1(2) , **does not apply** since this facility is not a major contaminate source.

Sourcewide Emission Limitations:

The emission particulate matter (PM) shall not exceed nine (90) tons during any consecutive twelve (12) month period. The emissions of volatile organic compounds (VOC) shall not exceed ninety (90) tons during any consecutive twelve month period.

Compliance demonstration:

Sourcewide Emission Limitations: Compliance with the PM emission limit is demonstrated by proper operation of the filter system that controls the saws (Dust Collection). Compliance with the VOC emission limit is demonstrated by proper operation of the regenerative thermal oxidizer (RTO) that controls the foam laydown process when the process is using pentane.

01 Foam Laydown: The only allowable emission rate for the foam laydown process is the sourcewide VOC emission limitations.

02 Dust Collection: Compliance with the hourly particulate matter mass emission limit and opacity limit will be demonstrated by proper operation of the filter system.

EMISSION AND OPERATING CAPS DESCRIPTION:

Firestone Building Products Company has requested that a conditional major permit be issued with federally enforceable conditions to limit emissions of VOC and PM to below major thresholds. This permit requires the foam laydown process to be controlled by a regenerative thermal oxidizer with a destruction efficiency of at least 95% for VOC (when the process is using pentane), and it requires the saws to be controlled by a filter system with a control efficiency of at least 99% for PM. These requirements will reduce the potential to emit (PTE) of VOC to 54.4 tons per year (including 1.7 tons per year from insignificant activities) and the PTE of PM to 4.9 tons per year.

PERIODIC MONITORING:

01 Foam Laydown: The permittee shall continuously monitor the combustion chamber temperature of the RTO when it is controlling emissions.

02 Dust Collection: The permittee shall perform a daily visual observation of emissions from the filter system.

OPERATIONAL FLEXIBILITY:

The permittee is in the process of eliminating the use of HCFC and modifying their process to utilize pentane as a substitute. They have requested the ability to switch back and forth between the HCFC 141b/R-22 formulation and the pentane formulation prior to the ban. Also, the regenerative thermal oxidizer is only required to control emissions while using the pentane formulation. Therefore, emission point 01 (Foam Laydown) has an alternate operating scenario for the pentane formulation.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.